

Determine if each conjecture is true or false based on the given information. Explain your answer and give a counterexample for any false conjecture.

1. Given: Collinear points D, E , and F .
Conjecture: $DE + EF = DF$.
2. Given: $\angle D$ and $\angle F$ are supplementary.
 $\angle E$ and $\angle F$ are supplementary.
Conjecture: $\angle D \cong \angle E$

3. Given: \overline{AB} is perpendicular to \overline{BC} .
Conjecture: $\angle ABC$ is a right angle.

Write each conditional statement in if-then form.

4. All chimpanzees love bananas.
5. Collinear points lie on the same line.

Write the converse, inverse, and contrapositive of the conditional.

6. All right angles are congruent.

Give a conclusion if possible. Identify the law of reasoning used. If invalid, write no conclusion

7. (1) If a number is a whole number, then it is an integer.
(2) If a number is an integer, then it is a rational number.

8. (1) If a dog eats Dogfood Delights, the dog is happy.
(2) Fido is a happy dog.

9. (1) If people live in Manhattan, then they live in New York.
(2) If people live in New York, then they live in the United States.

10. (1) Angles that are complementary have measures with a sum of 90.
(2) $\angle A$ and $\angle B$ are complementary.

11. (1) All fish can swim.
(2) Fonzo can swim.

12. Prove that if $3x - 2 = x - 8$, then $x = -3$.

Given: $3x - 2 = x - 8$

Prove: $x = -3$

Proof:

Statements

Reasons

a. $3x - 2 = x - 8$

a. _____

b. $2x - 2 = -8$

b. _____

c. $2x = -6$

c. _____

d. $x = -3$

d. _____